What is claimed is:

1   1. A method for detecting shadow regions in an image, the

2   steps comprising:

3   a) providing an original image;

4   b) modeling said image as a reliable lattice (RL);

5   c) determining a relationship between said RL model

6   and an Markov (MRF) model;

7   d) applying region level verification to said MRF

8   model; and

9   e) identifying shadow regions in said original image

10   from said MRF model.

1   2. The method for detecting shadow regions in an image as

2   recited in claim 1, wherein said original image is a single,

3   static image.

1   3. The method for detecting shadow regions in an image as

2   recited in claim 2, wherein said single, static image is

3   illuminated by substantially a single point illumination

4   source.

1   4. The method for detecting shadow regions in an image as

2   recited in claim 2, wherein said single point illumination

3   source is the sun.

1   5. The method for detecting shadow regions in an image as

2   recited in claim 2, wherein said single, static image

3   comprises an aerial image.

1   6. The method for detecting shadow regions in an image as

2   recited in claim 1, wherein said modeling said image as an RL

3   step (b) comprises the sub-step of modeling an initial RL.

1   7. The method for detecting shadow regions in an image as

2   recited in claim 6, wherein said modeling said image as an RL

3   step (b) further comprises the sub-step of updating said

4   initial RL.

1   8. The method for detecting shadow regions in an image as

2   recited in claim 7, wherein said sub-step of updating said

3   initial RL comprises iteratively updating said initial RL.

1   9. The method for detecting shadow regions in an image as

2   recited in claim 8, wherein said sub-step of iteratively

3   updating said initial RL continues until at least one of the

4   conditions have been met: a predetermined number of iterations

5   are performed, and until a predetermined condition is met.

1   10. The method for detecting shadow regions in an image

2   as recited in claim 1, wherein said modeling said image as an

3   RL step (b) comprises the sub-step of determining the

4   reliability of said RL.

1   11. The method for detecting shadow regions in an image

2   as recited in claim 10, wherein said sub-step of determining

3   the reliability of said RL comprises determining a maximum

4   reliability of said RL.

1   12. The method for detecting shadow regions in an image

2   as recited in claim 10, wherein said sub-step of determining a

3   maximum reliability of said RL comprises using an expectation

4   maximization (EM) algorithm.

1   13. The method for detecting shadow regions in an image

2   as recited in claim 1, the steps further comprising:

3   f) removing at least one false shadow region from a

4   list of detected shadow regions.

1   14. The method for detecting shadow regions in an image
2   as recited in claim 1, the steps further comprising:

3   f) preprocessing said original image from an a
4   red/green/blue RGB) color space into a normalized LogRGB
5   space.

1   15. The method for detecting shadow regions in an image
2   as recited in claim 1, the steps further comprising:

3   f) performing region level verification.

1   16. The method for detecting shadow regions in an image
2   as recited in claim 15, wherein said performing region level
3   verification step (f) comprises further exploiting domain
4   knowledge.